REMARKS

This Amendment is responsive to the Office Action dated January 15, 2004. All rejections and objections are respectfully traversed. Reconsideration is respectfully requested.

The Examiner has rejected claims 6-7 under 35 U.S.C. 101. Amendments to the claims are respectfully believed meet all requirements of the Examiner in this regard.

At paragraphs 3-11 of the Office Action, the Examiner rejected claims 1-4 and 6-11, citing United States patents 6,064,648 of Hellman et al. ("Hellman et al."), 5,917,823 of Benning et al. ("Benning et al."), 6,167,028 of Harris et al. ("Harris et al."), and 4,951,278 of Biber et al. ("Biber et al."). Applicant respectfully traverses this rejection.

Hellman et al. disclose a method for notifying a frame relay network of traffic congestion in an ATM network. When the ATM network provides a notification of congestion, a management message, which is independent from a user-traffic carrying message, is generated by the Hellman et al. system at an interface between the ATM network and the frame relay network and transmitted to the frame relay network sending user traffic to the ATM network. Hellman et al. teach that data is transmitted in a frame relay network in packets of varying length, referred to as frames. Hellman et al. describe a frame format that includes a Data Link Connection Identifier (DLCI), indicating a virtual connection and a virtual channel to which a particular frame belongs. The virtual channels described by Hellman et al. are distinguished from each other by means of the DLCI. The virtual connection identifications provided by the DLCI described by Hellman et al. are *unambiguous only over a single virtual channel*, and may change in the node on transition to the next virtual channel. Accordingly, Hellman et al. teach a system in which ***multiple virtual connections may be assigned to a single virtual channel***, and where a virtual connection is

distinguished from other virtual connections in a first virtual channel with a first identifier, and distinguished from other virtual connections within a second virtual channel using a second identifier. Hellman et al. state the following in this regard:

> The data link connection identifier, however, is unambiguous only over a single virtual channel, and it may change in the node on transition to the next virtual channel.

Accordingly, multiple data link connections are processed over a single virtual channel in the Hellman et al. system, thus requiring re-mapping of virtual connections to different virtual connection identifier spaces when changing virtual channels.

Benning et al. describe providing a packet switching network supporting X-series protocol access wherein Permanent Virtual Circuit (PVC) trunks are employed as the backbone trunks for the network. Benning et al. further describe transferring X.25 packets between packet engines by establishing permanent virtual connections between pairs of packet engines using frame relay protocol, selecting permanent virtual connections with to route packets between packet engines, encapsulating the packets into frame relay frames and attaching a DLCI (Data Link Connection Identifier) identifier. Benning et al. teach transmitting the encapsulated frames between the packet engines over the permanent virtual connections. As noted above in the discussion of Hellman et al., the DLCI described therein provides for independent identification of virtual channels and multiple virtual connections for those virtual channels.

Biber et al. disclose a high-level data link control packet assembler/disassembler for a data communications system having a layered communication architecture. The layered communication architecture of Biber et al. includes network services protocols including a link layer and higher level protocols, and has synchronous data link control (SDLC) devices including

a host computer and end user devices desiring to communicate across an X.25 packet-switching network (PSN) of the communications system. Biber et al. describe the use of virtual circuits and logical channels. Harris et al. describe facilitating transmission of cells having multiple priorities in a cell relay network that transmits cells having different priorities through a single virtual connection. Harris et al. describe using a communication channel in the context of using a satellite communication network.

Nowhere in Hellman et al., Benning et al., Harris et al. and Biber et al., taken either independently or in combination, is there disclosed or suggested any system or method for binding a connection-oriented client to a communication channel, that operates by:

> creating a communication channel ***for the connection-oriented client***, the communication channel having a channel identifier;
> creating a single virtual circuit for the connection-oriented client on the communication channel, ***wherein the virtual circuit is the only virtual circuit on the communication channel***;
> binding the communication channel to the connection-oriented client based upon the channel identifier; and
> ***forwarding data received from the communication channel to the connection-oriented client based upon the channel identifier.*** (emphasis added)

As in the present independent claims 1, 6, 8, 10 and 11. In clear contradistinction, Hellman et al. teach a system in which the virtual connection identification for a DLCI can become ***ambiguous within a virtual channel.*** Such ambiguity is only possible where ***multiple virtual connections may be associated with a single virtual channel.*** This stands in contrast with the present invention as set forth in the independent claims, in which a communication channel for a connection-oriented client uses a virtual circuit that is the only virtual circuit on a communication

channel, and that provides forwarding of data received to the connection-oriented client based on the virtual channel identifier. Moreover, the cited references contain no hint or suggestion of even the desirability of providing a one to one mapping between virtual circuits and communication channels for ***connection-oriented clients in particular***, as in the present independent claims.

For the above reasons, Applicant respectfully urges that the combination of Hellman et al., Benning et al., Harris et al. and Biber et al. does not disclose or suggest all the features of the present independent claims 1, 6, 8, 10 or 11. Accordingly, Applicant respectfully urges that the combination of Hellman et al., Benning et al., Harris et al. and Biber et al. does not support a *prima facie* case of obviousness under 35 U.S.C. 103, with regard to independent claims 1, 6, 8, 10 and 11. As to claims 2-4 and 7-9, they each depend from claims 1 and 6, and are believed to be patentable over the combination of Hellman et al., Benning et al., Harris et al. and Biber et al. for at least the same reasons.

At paragraphs 12-21 of the Office Action, the Examiner rejected claims 1-4 and 6-11, citing United States patents 5,970,048 of Pajuvirta et al. ("Pajuvirta et al.") and 6,229,787 of Byrne ("Byrne"). Applicant respectfully traverses this rejection.

Pajuvirta et al. teaches a congestion management technique for a frame relay network, which includes buffering data at an input boundary of a subscriber node to virtual-channel-specific buffers, transmitting congestion notifications in a backward direction from the network nodes to the subscriber node of the moment, and controlling the amount of traffic supplied towards the network from the subscriber node buffer. As described by Pajuvirta et al., the frame relay (FR) technique is a packet-switched network technique used for the transmission of frames of varying length in place of the packet-switched network connections earlier placed in use.

Pajuvirta et al. go on to state that the protocol (X.25) applied in packet-switched networks is expensive and slow, due to the fact that the X.25 standard was developed when the transmission connections used were still rather prone to transmission errors, and that the frame relay technique is based on a considerably lower transmission line error probability. The Pajuvirta et al. disclosure further teaches that buffers corresponding to service classes are provided at an output boundary of all network nodes and at the input boundary having trunk connections. Accordingly, the Pajuvirta et al. node receives FR frames originally assembled in bridges of subscriber connections. Pajuvirta et al. also shows a typical FR network frame format where the address field preceding the information field comprises two octets (bits 1 to 8), and where the bits 3 to 8 of the first octet and the bits 5 to 8 of the second octet form a data link connection identifier DLCI, which indicates the virtual connection and virtual channel to which a particular frame belongs. Like Hellman et al., Pajuvirta et al. teaches that virtual channels are distinguished from each other by means of the DLCI, that the DLCI is unambiguous only over a single virtual channel, and it may change in the node on transition to the next virtual channel.

Byrne discloses a mechanism for achieving very fast failover in ATM backbone networks using multi-homed circuits, in which a first end-to-end connection between a source node and a destination node is established. The first end-to-end connection described by Byrne may include a number of point-to-point links between a number of intermediate nodes. At the same time, the Byrne system establishes a second end-to-end connection between the source node and the destination node, which may also include a number of point-to-point links between a number of intermediate nodes, and includes some point to point links and intermediate nodes that are distinct from those which make up the first end-to-end connection. The source node in the Byrne

system establishes a session across the first end-to-end connection and, upon recognizing the failure of this connection, switches the session the second end-to-end connection automatically.

Nowhere in Pajuvirta et al. and Byrne, taken either independently or in combination, is there disclosed or suggested any system or method for binding a connection-oriented client to a communication channel, that operates by:

> creating a communication channel ***for the connection-oriented client***, the communication channel having a channel identifier;
> creating a single virtual circuit for the connection-oriented client on the communication channel, ***wherein the virtual circuit is the only virtual circuit on the communication channel***;
> binding the communication channel to the connection-oriented client based upon the channel identifier; and
> ***forwarding data received from the communication channel to the connection-oriented client based upon the channel identifier***. (emphasis added)

As in the present independent claims 1, 6, 8, 10 and 11. In clear contradistinction, Pajuvirta et al., using almost the same language as in Hellman et al., teach a system in which the virtual connection identification for a DLCI can become ***ambiguous within a virtual channel***. Such ambiguity is only possible where ***multiple virtual connections may be associated with a single virtual channel***. As mentioned above, this teaching is in contrast with the present invention as set forth in the independent claims, in which a communication channel for a connection-oriented client uses a virtual circuit that is the only virtual circuit on a communication channel, and that provides forwarding of data received to the connection-oriented client based on the virtual channel identifier. Again, the cited references contain no hint or suggestion of even the

desirability of providing a one to one mapping between virtual circuits and communication channels for ***connection-oriented clients in particular***, as in the present independent claims.

For the above reasons, Applicant respectfully urges that the combination of Pajuvirta et al. and Byrne does not disclose or suggest all the features of the present independent claims 1, 6, 8, 10 or 11. Accordingly, Applicant respectfully urges that the combination of Pajuvirta et al. and Byrne does not support a *prima facie* case of obviousness under 35 U.S.C. 103, with regard to independent claims 1, 6, 8, 10 and 11. As to claims 2-4 and 7-9, they each depend from claims 1 and 6, and are believed to be patentable over the combination of Pajuvirta et al. and Byrne for at least the same reasons.

Reconsideration of all pending claims is respectfully requested. Applicants respectfully request that the Examiner's rejections be withdrawn in view of the above remarks and the current amendments to the claims.

Applicants have made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone the undersigned Applicants' Attorney at 978-264-6664 so that such issues may be resolved as expeditiously as possible.

For these reasons, and in view of the above amendments, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Respectfully Submitted,

JUNE 28 2004
Date

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